

VIBRIOSIS

DISEASE REPORTING

In Washington

DOH receives 3 to 57 reports of vibriosis per year. *Vibrio parahaemolyticus* is endemic to the estuaries of Washington State; sources include sea water and raw or inadequately cooked seafood. *Vibrio vulnificus* infections usually result from exposures outside of Washington.

Purpose of reporting and surveillance

- To identify sources of transmission (e.g., a commercial product or shellfishing area) and to prevent further transmission from such sources.
- When the source is a risk for only to a few individuals (e.g., privately collected shellfish), to inform those individuals how they can reduce their risk of exposure.

Reporting requirements

- Health care providers: notifiable to Local Health Jurisdiction within 3 work days
- Hospitals: notifiable to Local Health Jurisdiction within 3 work days
- Laboratories: no requirements for reporting
- Local health jurisdictions: notifiable to DOH Communicable Disease Epidemiology within 7 days of case investigation completion or summary information required within 21 days

CASE DEFINITION FOR SURVEILLANCE

Clinical criteria for diagnosis

Vibriosis should be suspected if a patient has watery diarrhea and has eaten raw or undercooked seafood, especially oysters, or when a wound infection or sepsis occurs after exposure to seawater.

Laboratory criteria for diagnosis

Isolation of a pathogenic *Vibrio* species from a clinical specimen.

Case definition

- Probable: a clinically compatible case that is epidemiologically linked to a confirmed case.
- Confirmed: a case that is laboratory confirmed.

VIBRIO PARAHAEMOLYTICUS ENTERITIS**A. DESCRIPTION****1. Identification**

An intestinal disorder characterized by watery diarrhea and abdominal cramps in the majority of cases, and sometimes with nausea, vomiting, fever and headache. Occasionally, a dysentery-like illness is observed with bloody or mucoid stools, high fever and high WBC count. Typically, it is a disease of moderate severity lasting 1-7 days; systemic infection and death rarely occur.

Diagnosis is confirmed by isolating the Kanagawa positive vibrios from the patient's stool on appropriate media; or identifying 10⁵ or more organisms per gram of an epidemiologically incriminated food (usually seafood).

2. Infectious Agent

Vibrio parahaemolyticus, a halophilic vibrio. Twelve different 'O' antigen groups and approximately 60 different 'K' antigen types have been identified. Pathogenic strains are generally (but not always) capable of producing a characteristic hemolytic reaction (the 'Kanagawa phenomenon').

3. Worldwide Occurrence

Sporadic cases and common-source outbreaks have been reported from many parts of the world, particularly Japan, southeast Asia and the US. Several large foodborne outbreaks have occurred in the US in which undercooked seafood was the food vehicle. Cases occur primarily in warm months. Some recent outbreaks have been due to Kanagawa negative, urease positive strains.

4. Reservoir

Marine coastal environs are the natural habitat. During the cold season, organisms are found in marine silt; during the warm season, they are found free in coastal waters and in fish and shellfish.

5. Mode of Transmission

Ingestion of raw or inadequately cooked seafood, or any food contaminated by handling raw seafood, or by rinsing with contaminated water.

6. Incubation period

Usually between 12 and 24 hours, but can range from 4 to 30 hours.

7. Period of communicability

Not communicable from person to person.

8. Susceptibility and resistance

Most people are probably susceptible.

B. METHODS OF CONTROL**1. Preventive measures:**

- a. Educate consumers about the risks associated with eating raw seafood unless it has been irradiated.
- b. Educate seafood handlers and processors on the following preventive measures:
 - i. Ensure that cooked seafood reaches temperatures adequate to kill the organism by heating for 15 minutes at 70°C/158°F (organisms may survive at 60°C/140°F for up to 15 minutes and at 80°C/176°F for several minutes).
 - ii. Handle cooked seafood in a manner that precludes contamination from raw seafood or contaminated seawater.
 - iii. Keep all seafood, raw and cooked, adequately refrigerated before eating.
 - iv. Avoid use of seawater in food handling areas, e.g., on cruise ships.

2. Control of patient, contacts and the immediate environment:

- a. Report to local health authority.
- b. Isolation: Enteric precautions.
- c. Concurrent disinfection: Not pertinent.
- d. Quarantine: Not pertinent.
- e. Management of contacts: Not pertinent.
- f. Investigation of contacts and source of infection: Not pertinent. Control is of outbreaks; single cases are rarely identified.
- g. Specific treatment: Fluid replacement when indicated.

3. Epidemic measures

- a. By quick review of reported cases, determine time and place of exposure and the population at risk; obtain a complete listing of the foods served and embargo, under refrigeration, all foods still available. The prominent clinical features, coupled with an estimate of the incubation period, provide useful leads to the most probable etiologic agent. Collect specimens of feces and vomitus for laboratory examination; alert the laboratory to suspected etiologic agents. Interview a random sample of those exposed. Compare the attack rates for specific food items eaten and not eaten; the implicated food item(s) will usually have the greatest difference in attack rates. Most of the sick will have eaten the contaminated food.
- b. Inquire about the origin of the incriminated food and the manner of its preparation and storage before serving. Look for possible sources of contamination and periods of inadequate refrigeration and heating that would permit growth of staphylococci. Submit any leftover suspected foods promptly for laboratory examination; failure to isolate staphylococci does not exclude the presence of the heat resistant enterotoxin if the food had been heated.
- c. Search for food handlers with skin infections, particularly of the hands. Culture all purulent lesions and collect nasal swabs from all foodhandlers. Antibigrams and/or phage typing of representative strains of enterotoxin producing staphylococci isolated from foods and food handlers and from vomitus or feces of patients may be helpful.

4. International measures

WHO Collaborating Centres.

INFECTION WITH VIBRIO VULNIFICUS**A. DESCRIPTION****1. Identification**

Infection with *Vibrio vulnificus* produces septicemia in persons with chronic liver disease, chronic alcoholism or hemochromatosis; or those who are immunosuppressed. The disease appears 12 hours to 3 days after eating raw or undercooked seafood, especially oysters. One third of patients are in shock when they present for care or develop hypotension within 12 hours after hospital admission. Three quarters of patients have distinctive bullous skin lesions; thrombocytopenia is common and there is often evidence of disseminated intravascular coagulation. Over 50% of patients with primary septicemia die; the mortality rate exceeds 90% among those who become hypotensive. *V. vulnificus* can also infect wounds sustained in coastal or estuarine waters; wounds range from mild, self-limited lesions to rapidly progressive cellulitis and myositis that can mimic clostridial myonecrosis in the rapidity of spread and destructiveness.

2. Infectious Agent

A halophilic, usually lactose positive (85% of isolates) marine *Vibrio* that is biochemically quite similar to *V. parahaemolyticus*. Confirmation of species identity sometimes requires use of DNA probes or numerical taxonomy in a reference laboratory. *V. vulnificus* expresses a polysaccharide capsule, of which there are multiple antigenic types on its surface.

3. Worldwide Occurrence

V. vulnificus is the most common agent of serious infections caused by the genus *Vibrio* in the US. In coastal areas the annual incidence of *V. vulnificus* disease is about 0.5 cases per 100,000 population; approximately 2/3 of these cases are primary septicemia. *V. vulnificus* cases have been reported from many areas of the world (e.g., Japan, Korea, Taiwan, Israel, Spain, Turkey).

4. Reservoir

V. vulnificus is a free living autochthonous flora of estuarine environments. It is recovered from estuarine waters and from shellfish, particularly oysters. During warm summer months this *Vibrio* can be isolated routinely from most cultured oysters.

5. Mode of Transmission

Among persons of high risk, including those who are immunocompromised or have chronic liver disease, infection is acquired by the ingestion of raw or undercooked seafood. In contrast, in immunocompetent normal hosts, wound infections typically occur after exposure to estuarine water (e.g., boating accidents) or from occupational wounds (oyster shuckers, fishermen).

6. Incubation period

Usually 12 to 72 hours after eating raw or undercooked seafood.

7. Period of communicability

This is not considered to be an infection that is transmitted from person to person, either directly or via contamination of food except as described for *Vibrio cholerae* serogroups O1 and O139, section A5.

8. Susceptibility and resistance

Persons with cirrhosis, hemochromatosis and other chronic liver disease and immunocompromised hosts (from either underlying disease or medication) are at greatly increased risk for the septicemic form of disease. Based on data from the Florida State Health Department for the period 1981-1992, the annual incidence of *V. vulnificus* illness

among adults with liver disease who ate raw oysters was 7.2 per 100,000 versus 0.09 per 100,000 for adults without known liver disease.

B. METHODS OF CONTROL

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INFECTION WITH OTHER VIBRIOS

Infection with certain other *Vibrio* species has been associated with diarrheal disease. These include *V. cholerae* of serogroups other than O1, *V. mimicus* (some strains elaborate an enterotoxin indistinguishable from that produced by *V. cholerae* O1 and O139), *V. fluvialis*, *V. furnissii*, and *V. hollisae*. Septicemic disease in hosts with underlying liver disease, severe malnutrition or immunocompetence has rarely been associated with *V. hollisae*. *V. alginolyticus*.

